

## Reactivation of Recurrent Corneal Erosion Syndrome by Continuous Positive Pressure Ventilation

### To the Editor:

A 57-year-old man presented with a 3-day history of a painful, red right eye. On examination, he had a 4-mm central corneal epithelial defect. He had been diagnosed with right recurrent corneal erosion syndrome (RCES) 2 years previously, after a fingernail injury; there were no signs of underlying corneal dystrophy in either eye. He initially experienced 3 acute erosions over 6 months. Over the subsequent 18 months, he remained asymptomatic and was using liquid paraffin ointment at night. Two weeks before the onset of the current episode, the patient started nocturnal continuous positive airway pressure (CPAP) to treat obstructive sleep apnea/hypopnea syndrome (OSAHS). He reported that, although the general fit of the face mask was good, there was a small leak resulting in constant airflow over the right (but not left) eye.

The acute episode was managed using chloramphenicol ointment 4 times daily, carbomer lubricants every 2 hours, and nocte liquid paraffin ointment, and the fit of the face mask was improved. The epithelial defect resolved within 1 week, and no further recurrences had occurred 1 year later by using nocte liquid paraffin ointment.

OSAHS is caused by airway occlusion during sleep, and if left untreated, is associated with significant mortality.<sup>2</sup> CPAP functions as a pneumatic splint to maintain airway patency throughout all phases of sleep and has become the treatment of choice for OSAHS.<sup>3</sup> Up to 65% of patients report side effects such as rhinosinusitis and epistaxis, attributed mainly to high-flow air leakage over the face.<sup>4</sup>

Stauffer et al<sup>5</sup> describe a case of conjunctivitis and ocular irritation from a leaking CPAP mask. Bialasiewicz et al<sup>6</sup> report 2 patients who had

undergone penetrating keratoplasty in whom leaking CPAP masks led to conjunctival hyperemia, recurrent corneal erosion, infiltration of the puncture track and cornea, and superficial punctuate keratopathy. Healing improved after the pressurized air systems were modified to prevent air escaping from the nostrils. Our patient had no history of eye surgery; aside from the area of previous trauma, his ocular surface was normal.

There is no evidence that sleep apnea itself is a risk factor for RCES.<sup>7</sup>

In our case the temporal association between the recurrence of previously well-controlled RCES and the onset of a poorly fitting CPAP mask, along with the plausible mechanism of corneal drying leading to RCES, strongly suggests that the CPAP was responsible for the RCES reactivation. The resolution of symptoms and signs on refitting the mask is further verification of a causal relationship.

The increasing availability of CPAP interface devices warrants awareness by ophthalmologists and respiratory physicians of this potential problem. Corneal drying should be prevented when CPAP is instituted, particularly in patients who have a history of superficial corneal pathology.

**Tessa Fayers, BSc, MBChB, MRCOphth,\***

**David E. Simcock, MBBS, MRCP,†**

**Mark R. Wilkins, MD, FRCOphth‡**

\*St. Thomas' Hospital, London, UK  
†Department of Asthma, Allergy and Lung Biology, Guy's Hospital, London, UK  
‡Moorfields Eye Hospital, London, UK

### REFERENCES

1. Deleted in proof.
2. Partinen M, Jamieson A, Guilleminault C. The long-term outcome for obstructive sleep apnea syndrome patients: mortality. *Chest*. 1988;94:1200-1204.
3. Jenkinson C, Davies RJO, Mullins R, et al. Comparison of therapeutic and subtherapeutic nasal continuous positive airway pressure for obstructive sleep apnoea: a randomised prospective parallel trial. *Lancet*. 1999;353:2100-2105.
4. Massie CA, Hart RW, Peralez K, et al. Effects of humidification on nasal symptoms and compliance in sleep apnea patients using continuous positive airway pressure. *Chest*. 1999;116:403-408.
5. Stauffer JL, Fayer N, MacLurg BJ. Conjunctivitis from nasal CPAP apparatus. *Chest*. 1984;86:802.
6. Bialasiewicz AA, Englemann K, Richard G. Prolonged wound healing after perforating keratoplasty. CPAP hyperbaric ventilators for sleep apnea as a risk factor. *Ophthalmology*. 2000;97:437-440.
7. Mojon DS, Goldblum D, Fleischhauer J, et al. Eyelid, conjunctival, and corneal findings in sleep apnea syndrome. *Ophthalmology*. 1999;106:1182-1185.

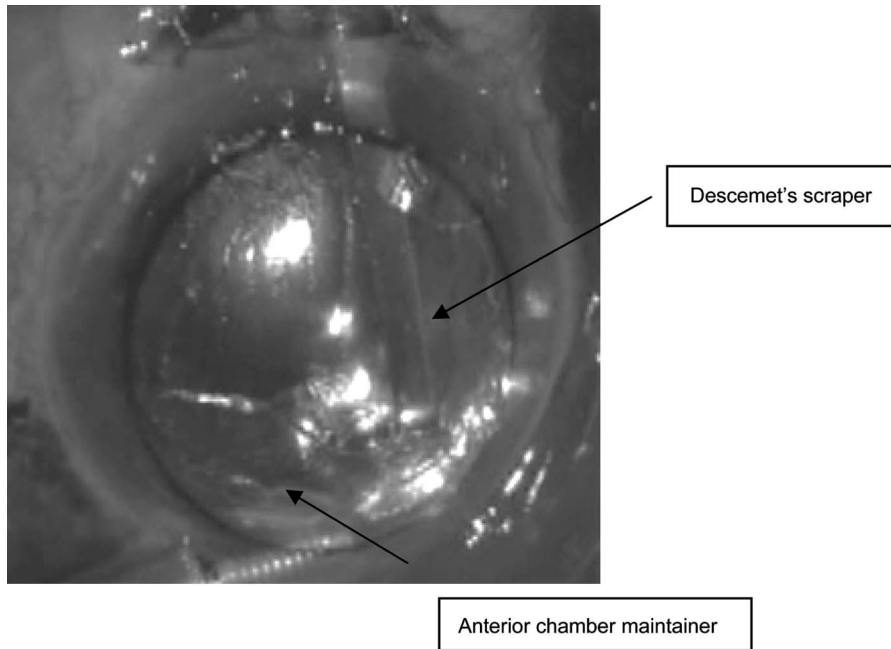
## Anterior Chamber Maintenance During Descemet Stripping

### To the Editor:

The report by Mearza et al<sup>1</sup> on their initial experience with Descemet-stripping endothelial keratoplasty (DSEK) was a refreshingly honest account of the difficulties of the procedure, particularly with respect to achieving adhesion between the donor lamella and the host stroma.

The authors attribute their high rate of dehiscence to an incomplete air-fill technique in the final stage of the procedure. I have also experienced several graft dehiscences in my early DSEK cases, despite filling the anterior chamber (AC) with air. At that time, my technique for Descemet stripping included the use of viscoelastic (Biolon; Kestrel Ophthalmics, Poole, UK) to maintain the AC. I switched to using air but found that this necessitated repeated refilling of the AC. For that reason, I used a Lewicky AC maintainer (BD Visitec, NJ) connected to a vitrectomy air exchange pump set at 40 mm Hg (Fig. 1). This allows controlled Descemet stripping with scrapers (DORC, Zuidland, The Netherlands) or descemetorrhexis forceps (Core Surgical, London, UK) without the use of hyaluronate viscoelastic, which Melles et al<sup>2</sup> have described as being the single most important factor interfering with donor attachment.

**Martin Leyland, BSc, MD, FRCOphth**  
Royal Berkshire Hospital, Reading, UK  
Oxford Eye Hospital, Oxford, UK



**FIGURE 1.** Anterior chamber maintained with air during Descemetorrhexis.

#### REFERENCES

1. Mearza AA, Quershi MA, Rostron CK. Experience and 12-month results of Descemet-stripping endothelial keratoplasty (DSEK) with a small-incision technique. *Cornea*. 2007;26:279–283.
2. Melles RJ, Ong TS, Ververs B, et al. Descemet membrane endothelial keratoplasty (DMEK). *Cornea*. 2007;25:987–990.

#### Reply:

We thank Martin Leyland for his interest in our report. He states that using a viscoelastic-free technique combined with a complete air fill has improved his dislocation rate.

Interestingly, Terry et al<sup>1</sup> has been using viscoelastic in his Descemet-stripping endothelial keratoplasty technique but has found that roughening the peripheral cornea before inserting the donor graft reduced the dislocation rate to just 4%.

With any new technique, it is always difficult to tease out which maneuvers have an effect on complications, especially in this situation, where it seems that there are many factors involved. As the technique has evolved, strategies have been developed to reduce graft dislocation. At the time of writing, attaining a complete air fill seems to be a critical factor, but no doubt further insight will be gained through continued research and discussion.

**Ali A. Mearza, FRCOphth\***  
**Chad K. Rostron, FRCOphth†**

\*Charing Cross Hospital  
London, UK

†St. George's Hospital  
Moorfields NHS Trust  
London, UK

#### REFERENCES

1. Terry MA, Hoar KL, Wall J, et al. Histology of dislocations in endothelial keratoplasty (DSEK and DLEK): a laboratory-based, surgical solution to dislocation in 100 consecutive DSEK cases. *Cornea*. 2006;25:926–932.

#### CORRECTION

Mathys KC, Cohen KL, Armstrong BD. Determining factors for corneal endothelial cell loss by using bimanual microincision phacoemulsification and power modulation. *Cornea* 2007;26:1049–1055.

In the article on page 1049, the authors wanted to include their funding in the footnote: “Funded in part by Research to Prevent Blindness, Inc., New York, NY.”

The authors apologize for this error.